

Amendments

In the Claims

✓ Please cancel claims 10-17, 19-22, 24-53, and 55-62 without prejudice to or disclaimer of the subject matter therein.

Please substitute the following claim 1 for the pending claim 1:

- B¹
1. (ONCE AMENDED) A biometric sensing apparatus, comprising:
a piezoelectric ceramic sensor having a plurality of piezoelectric ceramic elements arranged in an array, each of said elements having an impedance that varies according to an applied load, [said sensor operating in an impedance mode and detecting features of a finger proximate to said sensor;] and
a processor, coupled to said sensor, that receives an input from said sensor representative of features of the finger and produces an output.

Please substitute the following claim 54 for the pending claim 54:

- B²
54. (ONCE AMENDED) A biometric sensing apparatus, comprising:
a piezoelectric sensor responsive to features of a finger proximate to said sensor, said sensor operating in an impedance mode to produce impedance data; and
a processor, coupled to said sensor, that comprises an impedance detector that processes impedance data received from said sensor and produces an output representative of features of the finger.

Please add the following new claims 63-85.

- B³
63. (NEW) The apparatus of claim 54, wherein said output is data representing a fingerprint pattern.

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cont.

64. (NEW) The apparatus of claim 54, wherein said sensor further operates in a Doppler-shift mode to produce Doppler-shift data, and said processor includes a Doppler-shift detector that processes Doppler-shift data received from said sensor to produce a second output.

65. (NEW) The apparatus of claim 64, wherein the second output is data representing blood flow.

66. (NEW) The apparatus of claim 65, wherein the second output is data representing arteriole blood flow.

67. (NEW) The apparatus of claim 65, wherein the second output is data representing capillary blood flow.

68. (NEW) The apparatus of claim 54, wherein said sensor further operates in an echo mode to produce echo data, and said processor includes a signal-time-of-travel detector that processes echo data received from said sensor to produce a second output.

69. (NEW) The apparatus of claim 68, wherein the second output is data representing an arteriole-veinal map.

70. (NEW) The apparatus of claim 68, wherein the second output is data representing a bone map.

71. (NEW) The apparatus of claim 54, wherein said sensor further operates in a voltage mode to produce voltage data, and said processor includes a voltage detector that processes voltage data received from said sensor to produce a second output.

72. (NEW) The apparatus of claim 71, wherein the second output is data representing a fingerprint pattern.

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cont.

73. (NEW) The apparatus of claim 1, wherein said processor includes an impedance detector that processes the input received from said sensor to produce the output.

74. (NEW) The apparatus of claim 73, wherein the output is data representing a fingerprint pattern.

75. (NEW) The apparatus of claim 1, wherein said sensor further operates in a Doppler-shift mode to produce Doppler-shift data, and said processor includes a Doppler-shift detector that processes Doppler-shift data received from said sensor to produce a second output.

76. (NEW) The apparatus of claim 75, wherein the second output is data representing blood flow.

77. (NEW) The apparatus of claim 76, wherein the second output is data representing arteriole blood flow.

78. (NEW) The apparatus of claim 76, wherein the second output is data representing capillary blood flow.

79. (NEW) The apparatus of claim 1, wherein said sensor further operates in an echo mode to produce echo data, and said processor includes a signal-time-of-travel detector that processes echo data received from said sensor to produce a second output.

80. (NEW) The apparatus of claim 79, wherein the second output is data representing an arteriole-veinal map.

81. (NEW) The apparatus of claim 79, wherein the second output is data representing a bone map.

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amended.

82. (NEW) The apparatus of claim 1, wherein said sensor further operates in a voltage mode to produce voltage data, and said processor includes a voltage detector that processes voltage data received from said sensor to produce a second output.

83. (NEW) The apparatus of claim 82, wherein the second output is data representing a fingerprint pattern.

84. (NEW) The apparatus of claim 1, further comprising:
an input signal generator that applies an AC voltage signal across said plurality of piezoelectric ceramic elements.

85. (NEW) The apparatus of claim 54, wherein said piezoelectric sensor comprises a plurality of piezoelectric ceramic elements, and said apparatus further comprises an input signal generator that applies an AC voltage signal across said plurality of piezoelectric ceramic elements.